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## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/005,306

DATE: 05/31/2002

TIME: 11:52:51

Input Set : A:\P1042C1.txt

Output Set: N:\CRF3\05312002\J005306.raw

ENT

3 <110> APPLICANT: Lazarus, Robert A.  
 4 Pan, Clark Qun  
 6 <120> TITLE OF INVENTION: HUMAN ENASE I HYPERACTIVE VARIANTS  
 8 <130> FILE REFERENCE: P1042C1  
 10 <140> CURRENT APPLICATION NUMBER: US 10/005,306  
**C--> 11 <141> CURRENT FILING DATE: 2002-05-21**  
 13 <150> PRIOR APPLICATION NUMBER: US 08/663,831  
 14 <151> PRIOR FILING DATE: 1996-06-14  
 16 <160> NUMBER OF SEQ ID NOS: 17  
 18 <210> SEQ ID NO: 1  
 19 <211> LENGTH: 260  
 20 <212> TYPE: PR1  
 21 <213> ORGANISM: Homo sapiens  
 23 <400> SEQUENCE: 1  
 24 Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr Phe Gly Glu Thr Lys  
 25 1 5 10 15  
 27 Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser  
 28 20 25 30  
 30 Arg Tyr Asp Ile Ala Leu Val Gln Ile Val Arg Asp Ser His Leu  
 31 35 40 45  
 33 Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp Ala Pro  
 34 50 55 60  
 36 Asp Thr Tyr His Tyr Val Val Ser Gln Pro Leu Gly Arg Asn Ser  
 37 65 70 75  
 39 Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser  
 40 80 85 90  
 42 Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Gln Pro Lys Gly  
 43 95 100 105  
 45 Asn Asp Thr Phe Asn Arg Gln Pro Ala Ile Val Arg Phe Phe Ser  
 46 110 115 120  
 48 Arg Phe Thr Glu Val Arg Gln Phe Ala Ile Val Pro Leu His Ala  
 49 125 130 135  
 51 Ala Pro Gly Asp Ala Val Ala Gln Ile Asp Ala Leu Tyr Asp Val  
 52 140 145 150  
 54 Tyr Leu Asp Val Gln Glu Lys Trp Gly Leu Glu Asp Val Met Leu  
 55 155 160 165  
 57 Met Gly Asp Phe Asn Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln  
 58 170 175 180  
 60 Trp Ser Ser Ile Arg Leu Trp Thr Ser Pro Thr Phe Gln Trp Leu  
 61 185 190 195  
 63 Ile Pro Asp Ser Ala Asp Thr Thr Ala Thr Trp Thr His Cys Ala  
 64 200 205 210  
 66 Tyr Asp Arg Ile Val Val Ala Gly Met Leu Leu Arg Gly Ala Val

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```

67          215          220          225
68 Val Pro Asp Ser Ala Leu Pro Phe Asn Phe Gln Ala Ala Tyr Gly
69          230          235          240
70 Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser Asp His Tyr Pro Val
71          245          250          255
72 Glu Val Met Leu Lys
73          260
74 <210> SEQ ID NO: 2
75 <211> LENGTH: 260
76 <212> TYPE: PRF
77 <213> ORGANISM: Homo sapiens
78 <400> SEQUENCE: 2
79 Leu Lys Ile Ala Ala Phe Asn Ile Arg Thr Phe Gly Gln Thr Lys
80 1 5 10 15
81 Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
82 20 25 30
83 Arg Tyr Asp Ile Ala Leu Val Gln Gln Val Arg Asp Ser His Leu
84 35 40 45
85 Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp Ala Pro
86 50 55 60
87 Asp Thr Tyr His Tyr Val Val Ser Gln Pro Leu Gly Arg Asn Ser
88 65 70 75
89 Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
90 80 85 90
91 Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Glu Pro Cys Gly
92 95 100 105
93 Asn Asp Thr Phe Asn Arg Gln Pro Ala Ile Val Arg Phe Phe Ser
94 110 115 120
95 Arg Phe Thr Gln Val Arg Gln Phe Ala Ile Val Pro Leu His Ala
96 125 130 135
97 Ala Pro Gly Asp Ala Val Ala Gln Ile Asp Ala Leu Tyr Asp Val
98 140 145 150
99 Tyr Leu Asp Val Gln Gln Lys Trp Gly Leu Glu Asp Val Met Leu
100 155 160 165
101 Met Gly Asp Phe Asn Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln
102 170 175 180
103 Trp Ser Ser Ile Arg Leu Trp Thr Ser Pro Thr Phe Gln Trp Leu
104 185 190 195
105 Ile Pro Asp Ser Ala Asp Thr Thr Ala Thr Pro Thr His Cys Ala
106 200 205 210
107 Tyr Asp Arg Ile Val Val Ala Gly Met Leu Leu Arg Gly Ala Val
108 215 220 225
109 Val Pro Asp Ser Ala Leu Pro Phe Asn Phe Gln Ala Ala Tyr Gly
110 230 235 240
111 Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser Asp His Tyr Pro Val
112 245 250 255
113 Glu Val Met Leu Lys
114          260
115 <210> SEQ ID NO: 3

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## RAW SEQUENCE LISTING

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Input Set : A:\P1042C1.txt

Output Set : N:\CRF3\05312002\J005306.raw

139 &gt;211&gt; LENGTH: 260

140 &gt;212&gt; TYPE: PRT

141 &gt;213&gt; ORGANISM: Homo sapiens

143 &gt;400&gt; SEQUENCE: 3

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144  Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr Phe Gly Lys Thr Lys
145      1          5          10          15
147  Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
148      20          25          30
150  Arg Tyr Asp Ile Ala Leu Val Gln Gln Val Arg Asp Ser His Leu
151      35          40          45
153  Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp Ala Pro
154      50          55          60
156  Asp Thr Tyr His Tyr Val Val Ser Gln Pro Leu Gly Arg Asn Ser
157      65          70          75
159  Tyr Lys Gln Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
160      80          85          90
162  Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Gln Pro Cys Gly
163      95          100          105
165  Asn Asp Thr Phe Asn Arg Gln Pro Ala Ile Val Arg Phe Phe Ser
166      110          115          120
168  Arg Phe Thr Gln Val Arg Gln Phe Ala Ile Val Pro Leu His Ala
169      125          130          135
171  Ala Pro Gly Asp Ala Val Ala Gln Ile Asp Ala Leu Tyr Asp Val
172      140          145          150
174  Tyr Leu Asp Val Gln Gln Lys Trp Gly Leu Gln Asp Val Met Leu
175      155          160          165
177  Met Gly Asp Phe Asn Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln
178      170          175          180
180  Trp Ser Ser Ile Arg Leu Trp Thr Ser Pro Thr Phe Gln Trp Leu
181      185          190          195
183  Ile Pro Asp Ser Ala Asp Thr Thr Ala Thr Pro Thr His Cys Ala
184      200          205          210
186  Tyr Asp Arg Ile Val Val Ala Gly Met Leu Leu Arg Gly Ala Val
187      215          220          225
189  Val Pro Asp Ser Ala Leu Pro Phe Asn Phe Gln Ala Ala Tyr Gly
190      230          235          240
192  Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser Asp His Tyr Trp Val
193      245          250          255
195  Gln Val Met Leu Lys
196      260

```

198 &gt;2108&gt; SEQ ID NO: 4

199 &gt;211&gt; LENGTH: 260

200 &gt;212&gt; TYPE: PRT

201 &gt;213&gt; ORGANISM: Homo sapiens

203 &gt;400&gt; SEQUENCE: 4

```

204  Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr Phe Gly Arg Thr Lys
205      1          5          10          15
207  Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
208      20          25          30

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/005,306

DATE: 05/11/2002

TIME: 11:54:51

Input Set : A:\P1042C1.txt

Output Set : N:\CRF3\05312002\J005306.raw

```

210 Arg Tyr Asp Ile Ala Leu Val Gln Glu Val Arg Asp Ser His Leu
211           35           40           45
213 Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Ile Asp Ala Pro
214           50           55           60
216 Asp Thr Tyr His Tyr Val Val Ser Glu Pro Leu Gly Arg Asn Ser
217           65           70           75
219 Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
220           80           85           90
222 Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Glu Pro Cys Gly
223           95          100          105
225 Asn Asp Thr Phe Asn Arg Glu Pro Ala Ile Val Arg Phe Phe Ser
226          110          115          120
228 Arg Phe Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala
229          125          130          135
231 Ala Pro Gly Asp Ala Val Ala Glu Ile Asp Ala Leu Tyr Asp Val
232          140          145          150
234 Tyr Leu Asp Val Gln Glu Lys Trp Gly Leu Glu Asp Val Met Leu
235          155          160          165
237 Met Gly Asp Phe Asn Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln
238          170          175          180
240 Trp Ser Ser Ile Arg Leu Trp Thr Ser Pro Thr Phe Gln Trp Leu
241          185          190          195
243 Ile Pro Asp Ser Ala Asp Thr Thr Ala Thr Pro Thr His Cys Ala
244          200          205          210
246 Tyr Asp Arg Ile Val Val Ala Gly Met Leu Leu Arg Gly Ala Val
247          215          220          225
249 Val Pro Asp Ser Ala Leu Pro Phe Asn Phe Gln Ala Ala Tyr Gly
250          230          235          240
252 Leu Ser Asp Gln Leu Ala Glu Ala Ile Ser Asp His Tyr Pro Val
253          245          250          255
255 Glu Val Met Leu Lys
256          260
258 <210> SEQ ID NO: 5
259 <211> LENGTH: 260
260 <212> TYPE: PR1
261 <213> ORGANISM: Homo sapiens
262 <4> SEQUENCE: 5
264 Leu Lys Ile Ala Ala Phe Asn Ile Ile Thr Phe Gly Glu Lys Lys
265           5           10           15
267 Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
268          20           25           30
270 Arg Tyr Asp Ile Ala Leu Val Gln Glu Val Arg Asp Ser His Leu
271          35           40           45
273 Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Glu Asp Ala Pro
274          50           55           60
276 Asp Thr Tyr His Tyr Val Val Ser Glu Pro Leu Gly Arg Asn Ser
277          65           70           75
279 Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
280          80           85           90

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## RAW SEQUENCE LISTING

PATENT: A111111111 N: US/10/005,306

DATE: 05/31/2002

TIME: 11:52:11

Input Set: A:\P1042C1.txt

Output Set: N:\CRF3\05312002\J005306.raw

```

282 Ala Val Asp Ser Lys Lys Lys Asp Asp Gly Cys His Pro Lys Lys
283      5      10      15
285 Asn Asp Thr Phe Asn Arg His Pro Ala Ile Val Arg Phe Phe Ser
286      110      115      120
288 Arg Phe Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala
289      125      130      135
291 Ala Pro Gly Asp Ala Val Ala Glu Ile Asp Ala Leu Tyr Asp Val
292      140      145      150
294 Tyr Leu Asp Val His His Lys Trp Gly Leu Glu Asp Val Met Leu
295      155      160      165
297 Met Gly Asp Phe Asn Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln
298      170      175      180
300 Trp Ser Ser Ile Arg Leu Trp Thr Ser Pro Thr Phe Gln Trp Leu
301      185      190      195
303 Ile Pro Asp Ser Ala Asp Thr Thr Ala Thr Pro Thr His Cys Ala
304      200      205      210
306 Tyr Asp Arg Ile Val Val Ala Gly Met Leu Leu Arg Gly Ala Val
307      215      220      225
309 Val Pro Asp Ser Ala Leu Pro Phe Asn Phe Gln Ala Ala Tyr Gly
310      230      235      240
312 Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser Asp His Tyr Pro Val
313      245      250      255
315 Glu Val Met Leu Lys
316      260
318 <210> SEQ ID NO: 6
319 <211> LENGTH: 260
320 <212> TYPE: PRT
321 <213> ORGANISM: Homo sapiens
323 <400> SEQUENCE: 6
324 Leu Lys Ile Ala Ala Phe Asn Ile Glu Thr Phe Gly Glu Arg Lys
325      1      5      10      15
327 Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val Gln Ile Leu Ser
328      20      25      30
330 Arg Tyr Asp Ile Ala Leu Val Gln Glu Val Arg Asp Ser His Leu
331      35      40      45
333 Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp Ala Pro
334      50      55      60
336 Asp Thr Tyr His Tyr Val Val Ser Thr Pro Leu Gly Arg Asn Ser
337      65      70      75
339 Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
340      80      85      90
342 Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Glu Pro Cys Gly
343      95      100      105
345 Asn Asp Thr Phe Asn Arg Glu Pro Ala Ile Val Arg Phe Phe Ser
346      110      115      120
348 Arg Phe Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala
349      125      130      135
351 Ala Pro Gly Asp Ala Val Ala Glu Ile Asp Ala Leu Tyr Asp Val
352      140      145      150

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VERIFICATION SUMMARY

PATH: APPLICATION N: US/10/005,306

DATE: 05/31/2002

TIME: 11:52:02

Input Set : A:\P1042C1.txt

Output Set : N:\CRF3\05312002\J005306.raw

Full Model to Current Filling Date History Exploded Current Filling Date